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DETROIT

*A National Newspaper for Every Branch of the Industry*

# Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

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## March Sales in 38 States Hold 13% Lead Over Same States During February

### Total for March on This Basis Is Estimated at 90,000, or About 50% Under 1931

Detroit, April 22.—With the release today of sales figures for passenger cars in California, New York, New Jersey, Iowa and New Mexico for the month of March, these statistics are now available for thirty-eight states and the District of Columbia. The total passenger car sales for these thirty-eight states and the District in March, 1932, amounted to 83,615 units. This compares with 73,826 units in February, 1932, and with 179,734 in March, 1931.

The gain of March over February of this year is somewhat over 13 per cent. The decrease under the sales in March, 1931, is well over 50 per cent.

If further returns maintain the ratio shown by these from thirty-five states and the District of Columbia, March, 1932, sales will total just over 90,000 passenger car units.

The five new states which reported today are California, Iowa, New Jersey, New Mexico, and New York. The sales total for California in March of this year is 6,541, which compares with 15,689 in March, 1931. The New York state total for this March is 12,243, against 24,836. Iowa shows 1,387 sales in March, against 1,049 in February. New Jersey accounted for 3,860 sales, compared with 3,892 in February and New Mexico had 88 against 144.

## AMERICAN COMPANIES PLAN CANADIAN PLANTS

**Toronto, Canada,** April 22. — Announcement is made of the establishment of Canadian plants by two American manufacturers of automotive lines. The companies in question are the Pratt Chuck Company of Frankfort, N. Y., and the Pep Manufacturing Company of New York city.

A Canadian company has been formed under the title of Pratt Chuck Company, Ltd., with headquarters in this city, and affiliated with the parent American company at Frankfort, N. Y.

## WILLYS OFFICIAL EXPECTS TRUCKS TO SHOW GAIN FIRST

By WARD MORHUN,
Asst. Sales Mgr., Willys-Overland

**Toledo, O., April 22.—In my opinion the retail demand for commercial vehicles and trucks really represents a more accurate barometer of what one may expect in a betterment of business in general than does the sale of passenger cars. This opinion is based on several fundamental facts.**

There is no denying the fact that sale of commercial units during the few months of the current year that have passed is lower than the same period of last year, but it is significant to point out that the truck business as applied to the automobile industry as a whole is holding its own proportionately with passenger car business.

This reflects several things, chiefly that truck operators realize that it is misguided economy to operate a commercial vehicle that has seen its best days, although many such operators at this time are hesitant about replacing used units for new because of the uncertainty of immediate future conditions of general business.

Naturally trucks are subjected to

(Picture on Page 2)

## PRESCRIBES PRICE INCREASE FOR TIRES AS INDUSTRY TONIC

**Detroit, April 22. — Prescribing rather than predicting, J. F. O'Shaughnessy, general manager of the tire department of the United States Rubber Company, today declared that an increase in price was the tonic most needed by the tire industry.**

"An advance in tire prices should be made immediately," O'Shaughnessy said. "One look at the balance sheet of the industry is enough to indicate that. The best way to change the red ink into black is to raise prices to the point where a fair profit can be made.

"In the last few years tire mileage has been multiplied five times. This is a laudable development, but during this same period tire prices have been divided six times. The result is that prices today are at sub-basement level. They are so low that profit has vanished."

"Unless a business makes a reasonable profit, it has no good reason for existence. It affords little help to the people it employs, and it

(Continued on Page 3)

## CANADIAN FINANCING SHOWS GAIN IN MARCH OVER FEBRUARY LEVEL

**Montreal, April 22. — The figures for automobile financing compiled by the Dominion Bureau of Statistics show an increase in March, 1932, as moprade with February, 1932, and indicate a falling off in financing as compared with the corresponding month (March) in 1931. The percent of change is 44.9.**

The total number of cars financed was 4,805 in March, 1932; 4,170 in February, 1932, and 8,012 in March, 1931, and the amount involved was $1,953,981 in March, 1932; $1,529,368 in February, 1932, and $3,543,176 in March, 1931.

New cars financed were 1611 in March, 1932; 1,389 in February, 1932, and 2,884 in March, 1931; while used cars financed were 3,194 in March, 1932; 2,781 in February, 1932, and 5,128 in March, 1931.

Financing of new cars amounted to $1,036,442 in March, 1932; $727,705 in February, 1932, and $1,889,774 in March, 1931. Financing of used cars amounted to $917,539 in March, 192; $801,663 in February, 1932, and $1,-653,402 in March, 1931.

## STERLING CHIEF SEES IMPROVED SALES IN FALL

By E. M. STERNBERG,
President, Sterling Motor Truck Co.

**Milwaukee, Wis., April 22.—Owing to lack of cinstruction of all kinds and low commodity prices, heavy duty truck market is at lowest ebb. deferred recovery and no great improvement is expected for immediate future.**

We anticipate an improved demand for trucks by fall as the potential replacement market is rapidly growing and will open up at first sign of business recovery.

We have improved our product and organization, greatly reduced overhead and expenses and are prepared to go after business with greater determination to obtain our full share of existing business during balance of the year.

## VanDerZee Urges Using Old Cars as Down Payment Against New Car Purchases

### Sees 20,000,000 Vehicles in Use Now as Investment Factor in Market; Says 1932 May Top 1931

Detroit, April 22.—Comparison of 1932 and 1931 automobile sales by months from now on should show up much more favorably than was the case during the first quarter of the current year, in the opinion of A. vanDerZee, general sales manager, Dodge Brothers' Corporation. He further believes dealers should stress the benefit to owners of using their preent car as down-payment against a new car.

**In fact, vanDerZee believes there are very good possibilities of total sales during 1932 exceeding the 1931 figures.**

"Early April announcements of sensational new low-price models, intensive sales activity throughout the industry, the arrival of spring weather and the attendant urge to get out in the sunshine and fresh air—all these things have combined to release pent up enthusiasm and delayed buying," said vanDerZee.

"Pocketbooks have started yielding to values unsurpassed in the history of the industry, and I believe sufficient momentum has been built up to swing sales for the next nine months up to or even above 1931 levels.

"Fortunately, there are represented in the 25,000,000 automobiles in use in this country at lea t 20,000,000 down payments on eitl.er new or used cars. Buying an automobile, although unquestionably the second most important purchase the average man makes, has been made easier perhaps than most other commodities comparable in price. In most cases, simply turning in the old car is the major factor in acquiring a new or better one. Thus employment conditions are bettered. Money is put into circulation and progress made toward better times.

"Reports of increased pay rolls in industries affected by automobile manufacturing activity are already being heard. This helps dispel fear, the serious psychological deterrent to buying."

## PRODUCTION STARTED ON $2,000,000 BUS ORDER FOR GREYHOUND

**Pontiac, Mich., April 22.—Production on an order for Greyhound Management Company approximating $2,000,000 has begun at General Motors Truck Company. The buses comprise the regular annual allotment of motor coaches for the Greyhound company and will be used to replace present coaches.**

Although exact information on the order was not available at the factory it is understood it is for 200 Model Z-250 yellow parlor car buses of thirty-three-passenger size. Of this order 100 are to be assigned to operations in territory east of Chicago. The vehicles are to be powered with a six-cylinder, poppet-valve engine, have a displacement of 707 cubic inches and with a rating off 175 horse power.

The design will embody new features for quick removal of the power plant unit in much the same manner as is provided in the yellow V-type chassis. The seating arrangements call for three inches additional space between seats. The coaches are being produced at a

(Continued on Page 6)

## Graham Tells N. Y. Rockne Dealers of Bright Spots

**New York, April 22.—George M. Graham of Rockne arrived in this city today to conduct the twenty-first of twenty-seven meetings with dealers and salesmen on a coast-to-coast trip in the interest of his company. Today's meeting was held at Essex House and was attended by 300 dealers, salesmen from New York, New Jersey and Connecticut.**

Mr. Graham had some encouraging things to say regarding the day-to-day improvement in the position of the Rockne organization. The company now has 1,473 dealers and distributors in its sales division. Rockne took ninth place in the industry in shipments to dealers during March. Graham said that with a full line of cars available, Rockne's registrations in April will go well ahead of March and may double the total for that month.

Speaking more generally, Mr. Graham said that during his trip through all sections of the country, he found many business men and industrialists who are sick and tired of waiting for the depression to end and are doing individually what can not be done in mass. They are going out to sell their products.

With regard to the tax situation, Mr. Graham said that the House Ways and Means Committee would not put the proposed excise tax on the industry unless it could not possibly be avoided. After hearing Alfred P. Sloan, Jr., Edsel Ford and the other leaders of our industry, the legislators know that the automotive business is sick and has been for some time, and the tax will go through only as a last resort and not because they like it or want it. Only the greatest pressure will force the measure through Congress.

Mr. Graham leaves today for Buffalo, Toronto, three points in Texas and Atlanta, where he will wind up his meetings, having addressed the entire dealer organization, thousands of salesmen, bankers and others.

## Aged Cars Comprise Huge Replacement Market—Cord

**Auburn, Ind., April 22.—Practically one out of every two passenger automobiles in use at the end of 1931 was more than four years old, according to a recent compilation.**

This compilation showed that of the 20,300,000 passenger cars registered on December 31 last, 9,550,000, or 47 per cent., had been in use four or more years. Three and one-quarter millions of them had reached the age of seven years or more and slightly over 2,000,000 were more than eight years old. In other words, 16 per cent. of the cars then in use had passed the theoretical seven-year life of an automobile.

This, in the opinion of E. L. Cord, president of the Auburn Automobile Company, may be taken as an indication of the enormous potential replacement demand which will make its influence felt on the automotive industry during the next few years. Mr. Cord said:

"While business conditions of the last two years have made the individual more reluctant to make major purchases and while engineering developments and improved construction have lengthened the life of the automobile, it is certain these 2,000,000 cars now in their ninth year of service cannot be operated much longer. Sooner or later the owners of motor vehicles which have passed their normal period of usefulness will have to make a choice between trading them in on new cars or junking them."

## FRANKLIN SHIPPING NEW 12-CYL. MODELS

**Syracuse, N. Y., April 22.—First shipments of the new 12-cylinder supercharged Franklin car have just been made from the factory of the H. H. Franklin Manufacturing Company. Within two or three days, general national announcement of the Twelve will appear at the Franklin company's 500 dealerships throughout the country.**

Work on the Twelve has been the

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## *New De Soto Custom Coupe*

**A custom coupe priced at $790 has been recently added to the De Soto line and shipments are now being made daily to dealers throughout the United States. Equipment includes six wire-wheels and fender wells, rumble seat, special trim, adjustable driver seat, twin horns and generous use of chrome and catalin**

# N. Y. S. A. E. Discusses Bus And Truck of the Future

By J. RUSSELL WALSH

**New York, April 22.—One of the most interesting meetings of the current season of the Metropolitan Section of the Society of Automotive Engineers was held last evening at the A. W. A. Clubhouse.**

Two talks were presented, the frist by B. B. Bachman, vice-president in charge of engineering of the Autocar Company, on the subject of "The Bus and Truck of the Future," and the other, on "The Needs and Developments of Military Transport," which was presented by Col. E. S. Stayer, commanding officer at Camp Holabird, Quartermaster Depot.

Mr. Bachman stated that future developments will be toward additional engine power, greater comfort and safety. We may look for wider roads, he said, reduced grades, the elimination of crossings and other improvements in highway travel. More attention will be given to stability and the effect of windage in body design.

It is essential that higher average speeds be provided. Engine displacements per cylinder will probably be reduced. At the present some engines have displacements as high as 150 cubic inches per cylinder. A desirable maximum would be 125 cubic inches and the speaker was of the opinion that 100 cubic inches per cylinder would be better. The constant pressure engine offers desirable features for high and variable speeds, but not much is expected from Diesel engine developments.

Multi-range transmissions have been developed over recent years, and it appears that transmissions of the future will approach intimate ratios. Axles at present are too heavy and seem destined to grow still heavier. Independent springing of each wheel may be a future development. Mounting the engine at the rear is a possibility.

Improvement in control can be anticipated, with greater loads, higher speeds and increased mileage, together with larger section pneumatic tires. Steering has been greatly improved to offset these conditions, and at present power steering is being developed.

The clutch and transmission leave much to be desired. The electric transmission has been tried in some instances, but is not entirely satisfactory.

In brake design, development which will permit the dissipation of the heat energy as quickly as it is generated, is an ideal for approach. Other desirable characteristics which Mr. Bachman projected into the future were an engine whose thermal and mechanical efficiencies were equal; full torque over the speed range, and the combination body and chassis with independently sprung wheels.

Col. Stayer presented as the problem of the Quartermaster Corps the need for motor transportation, which will be extremely high on good roads, relatively high in cross-country use and capable of negotiating shell-torn terrain which is encountered under war conditions. He repeated the duty of the Quartermaster Corps as it relates to transportation in the words of one of the early quartermaster officers to get there "fustest with the mostest men." A maximum of ability is required with a minimum of vehicles.

In developing the military program it is necessary to keep in mind the importance of the facility of maintenance, which takes into consideration the maximum interchangeability of units and parts. In the army five groups of vehicles, with pay load capacities ranging from 3,000 to 22,000 pounds, have been developed. Both water and air-cooled engine types are included in the several groups; the various units of the trucks were obtained in the industry and a high percentage of interchangeability by careful selection is possible in the groups.

As a result of studies conducted by the Quartermaster Corps, the conclusion has been reached that, despite the severe requirements for military transport, the design must incorporate a wheel drive. Multiple axles are necessary and front drive is incorporated. Slow moving transportation and caterpillar tractors have been discarded.

Pierre Schon, sales engineer of the General Motors Truck Company, presented slides showing the regulation which the truck industry has to contend with and the wide divergence of legislation governing truck lengths, widths and permissible loads. The industry, Mr. Schon stated, was facing a serious situation in the next few years. Railroad lawyers have decided the dimensions of the motor vehicles, regardless of the designing engineers in the motor truck industry. The tendency in legislation is shown by a bill passed last month in Kentucky limiting the maximum load to 18,000 pounds and the vehicle length to twenty-six feet for a single vehicle.

For the May meeting William E. John of the Sterling Engine Company, vice-chairman of the Marine Division, reported that a speaker had not yet been obtained, but it was hoped that C. F. Kettering, vice-president of General Motors Research Corporation, will be available.

F. H. Dutcher, vice-chairman, opened the meeting which was conducted by F. K. Glynn who was responsible for this evening's program.

## PRAISES SERVICE BY MOTOR TRUCKS

**West Haven, Conn., April 22.—"The only benefit that railroads can obtain from truck regulation is an increase in motor truck rates and possibly a return of some of this business to the rails," said Myles W. Illingworth of Hartford, executive secretary of the Motor Truck Association of Connecticut, Inc., who addressed the Rotary Club of West Haven at its weekly meeting yesterday on "Progress of Transportation." He said in part:**

"If these carriers are to be surrounded with the red tape that now surrounds the railroads, if they are to be afflicted with traffic departments, accounting departments and other expenses which are not now felt necessary either by the motor truck operators or the shippers who use them, obviously the cost of transportation will be increased. The shippers are not complaining about the rates, rules or regulations of motor carriers.

"If rail carriers are authorized to participate in highway transportation by motor vehicles through subsidiary companies, the law should provide that losses from operation of such subsidiaries in strictly highway service should not be charged against rail revenues derived from other operations.

"A great deal of the business which motor trucks are handling is business which the railroads never handled, due to economic conditions which have resulted in quite a revolution in the manner in which business is now done, as compared with 1921, which has resulted in merchants all over the country carrying smaller stocks and demanding more frequent deliveries.

"Motor trucks are indispensable to New England industry in its fight for prosperity. The key to success in today's high-pressure competition is rapid distribution. Retailers and jobbers have curtailed inventories to a minimum to obtain the benefits of rapid turnovers.

"Here is where the motor truck has been doing a good job for New England and can do a better one as its advantages are more fully realized.

## WILLYS OFFICIAL EXPECTS TRUCKS TO SHOW GAIN FIRST

**(Continued from Page 1)**

greater wear and harder usage than passenger cars and as a result the replacement of these units is larger proportionately. The modern truck operator appreciates that he needs modern equipment in order to place him in a fair competitive position and that to operate vehicles that require more than normal servicing is not only reducing his profits, but affording the competitor who is using up-to-date equipment a distinct advantage.

Viewing the situation as a whole, I am convinced that an upswing in truck sales will precede that of passenger cars when the present era of curtailed buying has run its course.

What the remainder of the present year holds for the truck end of the automobile industry is problematical and it would be unwise to make any prediction except to say that truck operators will be quick to sense a betterment of conditions and when that time comes will not hesitate to immediately equip themselves with modern units so as to be in a position to obtain their fair share of business and to place their operations on a more profitable basis.

# SPARKS from DETROIT

**Henry Ewald's Birthday**
* * *
**The Power of Power**
* * *
**Adcrafters Elect**
* * *
**Individual Showrooms**
* * *
**Chick Epigrams**

*Chris Sinsabaugh—Detroit Editor*

DETROIT ROTARY is a birthday specialist, probably the only one of the kind in this world-wide organization. Once a month it throws a birthday party for members whose natal day falls in that particular month. This takes the form of a luncheon meeting, at which those to be honored sit at the speakers' table.

The April babies had their inning on Wednesday and the break favored Henry T. Ewald, head of the Campbell-Ewald Advertising Agency. That day was his birthday and the affair really was his birthday party. Which made it a natural that the whole program should be spiced with an automobile flavor. Not only was Henry chairman of the luncheon, but the big speaker of the occasion was Harry J. Klingler, vice-president and general sales manager of Chevrolet Motors.

* * *

MEBBE HENRY EWALD didn't depart from routine in staging that affair! He showed 'em what an advertising man really can do when he struts his stuff. The affair started with the orchestra blazing away with pistols at big bunches of toy balloons. The shots released the balloons and pandemonium ensued while the "boys" were busting 'em. All sorts of unique stunts were pulled during the meal. When Klingler finished his speech a huge siren started shrieking and a board back of the speakers' table, on which were pinned advertising wheels carrying statistics about the automobile industry, gave us another surprise when the wheels themselves started to revolve. It was a glorious finish.

* * *

WE AUTOMOBILE PEOPLE felt at home at the Rotary affair, for the cheer leader was an old friend, the same Bill Power who officiates at all the banquets of the General Motors units. In fact, cheer leading is Power's job. He started as director of physical education classes and found that his calesthenic classes worked better to music. He became a "wow" at this, and when he was transferred to Flint, R. H. Grant, then Chevrolet sales manager, discovered his talents. From that time on Power has been a General Motors man and he has followed the fortunes of Grant ever since. So when Henry Ewald threw his party, he borrowed Power, and that's why the luncheon had such a powerful punch.

* * *

THAT OTHER DETROIT organization to which the automobile people give liberal support, the Adcraft Club, held its annual election this week, and the new administration includes several who belong to the "Who's Who" of this industry of ours. John B. Gaughen of the Capper farm papers did such a good job as president that he was re-elected for a two-year term. Gaughen belongs to our crowd.

Then Austin F. Bement, who handles Packard advertising, was tapped on the shoulder and made vice-president. Our own George Mertz Slocum (as if he did not hold enough offices already), and Walter Boynton, A. D. N.'s first column conductor, and also Verne Tucker of Campbell-Ewald, are among the directors.

* * *

FEDERAL TRUCK gives us something new in its efforts to develop business by means of demonstrations and personal contacts in the field. Each Federal salesman engaged in this work drives through the territory a Federal three-ton six-wheeler, equipped with a stake body, which carries one of the new one and a half-ton $695 Federals. This way each man has his own show window with him.

* * *

A FEW OF THE EPIGRAMS John Chick, Cadillac sales manager, is passing out to the salesmen in the field through the medium of the company's publication are: "If you were the boss, would you hire yourself for the job?" "Obstacles are the biggest bluffers in the world." "You can't let up on enthusiasm and keep up on sales." "Brains get rusty and, after they stand still for a time, it's hard to get them going again."

# Retail Salesmen—This Is Your Page

**This department is devoted to the interests of the retail sales division of the industry. Salesmen, this is your department. Automotive Daily News wants you to get something from this department that will help you in your work on the firing line. It wants you to pass on your own experiences, successes, failures to help your brother salesmen. Send in your story in the form of a letter, or even a postal card, and let us get it ready for publication. Your achievement or your mistake may help another salesman to make sales or avoid errors that cost you commissions.**

**Dealers read this page. Give us the benefit of your reactions on these problems that affect the work of your salesmen, the men on the firing line, the men who bring home the bacon or don't.**

## -THE 5 DECISIONS THAT TURN PROSPECT INTO CUSTOMER

In its course on specialized automobile salesmanship, the La Salle Extension University divides the processes that lead the prospect into actually becoming a customer into five definite decisions. It is obviously the constructive salesman's business to help his prospect make these five decisions and sign on the dotted line. This is the way that the La Salle course lays out the five decisions: The need, the thing to meet the need, the source, the price and the time. Now read on:

**These five decisions, which every prospect must make before he makes the final decision to buy a car, are as follows:**

Decision One: That he wants or needs some car. (The need.)

Decision Two: That your car best meets his needs and wants in an automobile. (The thing to meet the need.)

Decision Three: That your car is backed by an organization of integrity, stability, and the highest standards of service; and that you, and the dealer from whom he will buy, are the sort of men who can be depended upon to see to it that he gets these desirable features. (The source.)

Decision Four: That the price of your car is "right," that the terms are satisfactory, and that your deal gives him the greatest dollar-for-dollar value obtainable in the automobile field. (The price.)

Decision Five: That he will fulfill his want for a car now. (The time.)

Detailed explanation of how the prospect may be helped to make these five decisions will be taken up in later assignments. But it is important right here for every salesman to know that these five decisions must be made before any sale is successfully concluded.

These decisions are not always made by the prospect in the same order. It is often the case that when you meet the prospect he has already made one or more of these decisions. For example, a man make the first and last decisions before he ever exposes himself to a salesman, or he even may make all except the third one before you meet him.

There is no set time or place when these decisions are to be made, any more than there is a definite order in which they will be made. The first decision may have been made a number of years past. He may have decided long since that he can never get along without owning a car. But does he need a new car now? Or does he need an additional car now? These are decisions that must be made before he buys a new or an additional car.

In preparing this sales training, much field investigational work was done and many interesting facts were brought to light concerning the reasons why prospects buy and how salesmen sell cars. One of the most important matters brought out was the neglect, by far too many salesmen, of securing one or more of these five decisions.

A salesman gives a prospect a detailed explanation of the car. The prospect is interested. The salesman goes on to tell about his company, its leadership in the industry, its stability, its progressive policies. It is an interesting and stimulating story to the prospect. He may know part of it already from advertising, from hearsay, and from the news columns of the daily paper. He shares the enthusiasm of the salesman, perhaps. And the salesman convinces the prospect that the price of the car is right, and he offers the prospect a trade-in allowance that is satisfactory.

And yet the prospect does not buy!

You can readily see why, now. Take a look at the five decisions! What did the salesman fail to do? Obviously, he omitted to secure Decision One and Decision Five. He didn't make the prospect decide (Decision One) that he needed a new car. And he didn't make the prospect decide (Decision Five) that he needed the new car now!

This salesman did just what is altogether too easy to do these days—assume that every one would like to have a new car and let it go at that.

It is quite true that every one does. "If wishes were horses, then beggars could ride." But it takes more than a vague wish to make a man part with money—a lot of money. It takes an intense need, a deep and strong want, to carry a prospect through all five decisions.

This leads us to the next consideration: What are people's reasons or motives for buying automobiles?

(To Be Continued)

## PRESCRIBES PRICE INCREASE FOR TIRES AS INDUSTRY TONIC

(Continued from Page 1)

certainly is not an asset to the country. What this country needs today is many businesses making money. We people of the tire industry should see to it that we contribute to better times by operating at a profit."

An increase not only in tire prices, but also in all commodities must be made, O'Shaughnessy said, before the economic situation in this country returns to normal.

"Manufacturers have liquidated their businesses," O'Shaughnessy said. "They have reduced overhead. They have scaled down their inventory. They have readjusted salaries and wages. But with all this, they can't expect to conduct their business on a profitable basis with commodity prices at their present level. The prices must come up.

"In addition the government must follow the example set by business in the matter of liquidation. There seems to be a tendency on the part of the government to continue functioning at the same exorbitant expense which has marked its operation for the past several years. This cannot be done. The government must reduce expenses. It cannot depend on taxation alone to balance its books."

Mr. O'Shaughnessy has just returned from one of his semi-annual trips to the Los Angeles plant of the United States Rubber Company.

### PLAN 2-CENT GAS TAX INCREASE IN NEW JERSEY

**Trenton N. J.**, April 22.—An increase of 2 cents a gallon in the gasoline tax to provide funds for emergency relief pending the floating of a $20,000,000 bond issue was tentatively agreed upon at a conference of Gov. Moore and legislative leaders yesterday. State Relief Director Chester Barnard told the conference that the present fund will be exhausted July 1.

## KEEP YOUR EYE ON YOUR OWNERS, SALESMAN SAYS

By W. ELLIS DOOLITTLE
Clifton, N. J.

My first thought in selling is general appearance, which I believe makes a strong impression upon the prospect. Therefore I always try to look neat—always have face shaved, shoes shined and clothes pressed.

After that I consider my approach to the prospect which depends largely upon type of buyer. While talking to the prospect, I study his manner, his questions and general interest that he apparently shows; and, if possible, I try to fall in line with any weakness that I may discover in him.

Regarding the best way of securing prospects, I find the owner whom I have previously sold as one of the best sources, due to the entire satisfaction he received when he purchased his car. Never do I promise anything I cannot live up to.

My connections with different organizations help me in my contact work. At any bridge party or house party, my first thought is: Are there any prospects here? I inquire in a joking way, and that, at once, lets the people know I am in the automobile business.

I often send out special letters to owners who I think will be in the market, either for a new car or one better than they own at present, asking them to call, as I have something exceptional to offer, and that immediately arouses their curiosity, and they call at the showroom to inquire about the offer.

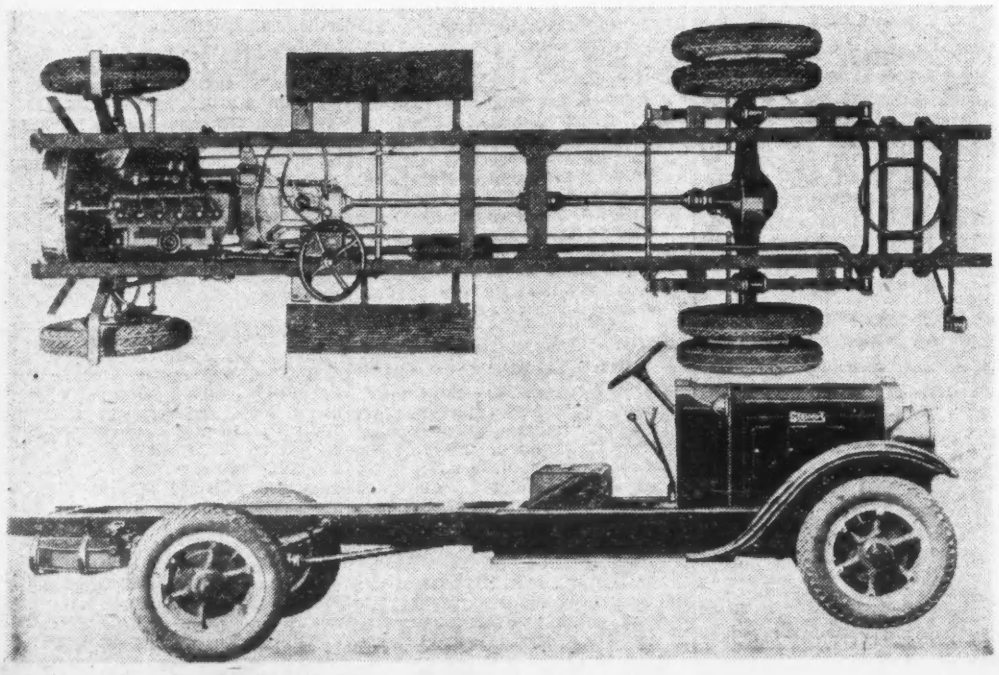
One thing I consider very important. When an appointment is made, I never fail to be on time. If I find I cannot keep it, I phone the prospect and make different arrangements. As far as demonstrations are concerned, that is my last thought, as I very seldom give one unless it is necessary to close the deal.

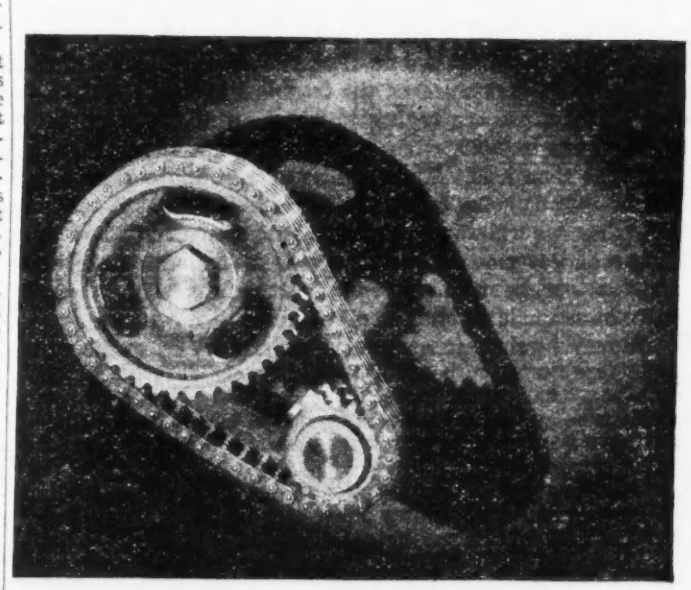
After serving Mr. Prospect to the best of my ability, I then make my final plea for his order, which sometimes works and other times does not.

### SAFETY GLASS BILL BEFORE N. J. LEGISLATURE

**Trenton, N. J.**, April 22.—Automobiles manufactured after July 1, 1933, would be required to be equipped with non-shatterable glass to qualify for registration in New Jersey under a bill introduced in the Legislature by Senator Sterner of Monmouth.


*Stewart 1½-Ton Truck Model 42X*





IT is a fact that the reliable performance of today's automobile motor is taken for granted by the average purchaser. Designing engineers have labored long to give today's car owner this assurance. One of the reasons for reliable motor performance is the great care used in the selection of parts—for efficiency and long life. And we point with just pride to the place Link-Belt Silent Chain has earned through its reliable performance on motors—in all price classes. ¶"Timed by Link-Belt" has come to mean "Timed for Reliability"—for silent, smooth, enduring service. The number of auto models, auto motors, trucks, buses and marine motors using Link-Belt as standard equipment is an emphatic endorsement of Link-Belt.

LINK-BELT COMPANY
INDIANAPOLIS DETROIT

LINK-BELT
AUTOMOTIVE SILENT CHAIN

# Automotive Daily News

"Of, By and For the Entire Automotive Industry"

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## *Where Have They Gone?*

CHARLES M. SCHWAB has a genius not only for optimism but also for arresting expression. When he remarked the other day that "there are no rich men left in these United States," or words to that effect, he instantly made the first page of almost every newspaper in the country.

In analyzing Mr. Schwab's statement we must bear in mind that everything in human life is comparative. The thirty-dollar-a-week clerk who came into a fortune of $100,000 would consider himself a rich man. He is, by his basis of comparison. The man who was worth $20,000,000 in 1929 and now finds himself with a meager $5,000,000, probably considers himself poor. He is, by his basis of comparison.

The whole United States today is poor in comparison with what it thought it was in 1929, but actually, is this true? It seems to us that much of the trouble lies in the fact that in many ways we are trying to carry on at the same rate that we were in 1929, with an actual income far below the levels that then held. The expense of running our government in 1932 is going to be very little below what it was in 1929, when we wallowed in profits, real or paper. The total expense of government in this country—Federal, state and municipal—makes a sum so vast that the mind staggers, and yet we have made no sincere effort to cut it down.

It may be that we are entering upon an era which for a considerable period is going to show bases differing utterly from those that we thought existed in 1929. If that be true, our mistake so far has been in trying to continue on a basis that takes its measuring stick from the inflation era of three or four years ago.

The concrete fact that sticks up out of all the confusion is that we are reeling along under taxation that would have been hard to bear at the height of the boom.

When will our national legislators heed the cry of distress that goes up from the entire country and take the obvious means of relieving the people of the taxes that are oppressing them and halting efforts to develop business in keeping with the new state of affairs that we face?

Many of our congressmen have shown that they are drawing their comparisons from years that are history. They pile tax on tax until individual income is overburdened. Yet we have a plain and obvious method of paying the costs of government without this grievous tax on business effort. Perhaps the elections next fall may produce a lower house more influenced by dictates of common sense.

We might also remember that if, as Mr. Schwab suggests, rich men in this country have become poor men, poor men have become paupers and their families are suffering.

## *Many Hands*

WE have talked much recently of the many hands which receive work through the sale of a motor vehicle. General Motors estimates that the sale of one of its vehicles gives work equaling eighty days' employment for one man.

From the Hudson Motor Car Company have just come some interesting figures along this line. The company states that it purchases parts for use in its vehicles from 449 firms, located in 148 cities, in twenty states and Canada. Firms selling these products employ more than 500,000 men and have payrolls running into millions of dollars a year. The workers on these payrolls support approximately 2,000,000 dependents.

The suppliers of parts in turn purchase from other manufacturers and growers and handlers of raw materials.

This gives us a good picture of the financial ripples that are generated by the purchase of a motor vehicle.

# Trade Association News

## Minnesota M.T.A. to Publish Own Used Car Guide

**Several years ago the Minnesota Motor Trades Association published its own used car market report. This service enjoyed a wide circulation in the Northwest and was well accepted by the trade. This guide was finally discontinued when the association came to an agreement with the publishers of the Blue Book, whereby members of the organization were to receive that publication in place of their own.**

The agreement between the Minnesota Motor Trades Association and the Blue Book publishers has been discontinued and the association is making preparations again to publish its own used car price guide. This is to be a complete pocket size service, showing the market value of used cars in the district. Distribution will be free to members of the association. The new guide will be published some time during this month.

The association is sending a bulletin to members regarding their position, with respect to the state workman's compensation act, as follows:

It has been called to our attention that a number of the members of the association have elected not to come under the workmen's compensation act in this state. This is a perfectly legal procedure, but we cannot believe that the action is well understood.

The law in this state provides that any employer of labor may, if he chooses, elect not to come under the compensation insurance act. Notice of such election must be mailed to the Industrial Commission and posted in the place of employment involved. Such an action eliminates the necessity of buying workmen's compensation insurance.

However, there is considerable hazard to such a procedure. If a workman is injured in such a place of employment he may sue the employer in the regular courts for any amount which he deems proper. If a case of this kind gets into the hands of a sympathetic jury the amounts awarded may be quite large, which the employer will have to pay. There is no restriction as to the amount which can be claimed, as there is under the workmen's compensation act.

If you are considering making this election we urge you to consider all factors before making the decision.

The association announces that E. B. Stone and Frank Stone have been employed as field representatives of the association. They also represent the Minnesota Motor Trades Insurance Agency. We will appreciate any courtesies or cooperation extended to these men in the new work that they are doing.

## COMING EVENTS

**APRIL**

12-27—**Milan, Italy.** International Automobile Salon.
23-May 2—**Zagreb, Jugo-Slavia,** Automobile Salon.
27-29—**New York city.** American Welding Society.

**MAY**

1- 8—**Penzan, Poland.** International Fair.
2- 6—**Philadelphia, Pa.** American Society of Mechanical Engineers management division meeting.
4- 6—**Honolulu, Hawaii.** National Foreign Trade Council.
4- 7—**Dublin, Ireland.** Commercial Car Show.
7-11—**Cleveland, O.** American Society for Testing Materials, meeting.
7-16—**Budapest, Hungary.** International Fair.
12-13—**Cleveland, O.** American Gear Manufacturers' Association, meeting.
14-15—**Atlantic City, N. J.** Annual convention New Jersey Automotive Trade Association, Hotel Jefferson.
16-20—**San Francisco, Cal.** United States Chamber of Commerce, annual meeting.
19-20—**Chicago, Ill.** National Battery Manufacturers Association meeting, Hotel Sherman.
23-28—**Chicago, Ill.** Radio Manufacturers Association, meeting, Hotel Sherman.

**JUNE**

**Bordeaux, France.** Automobile Show.
**Cork, Ireland,** Commercial Car Show.
**Paris, France.**—International Automobile Manufacturers Association sixth annual Motor Transport Congress.
1- 3—**Tulsa, Okla.** American Petroleum Institute, mid-year meeting, Mayo Hotel.
8-11—**State College, Pa.** American Society of Mechanical Engineers, National Oil and Gas Meeting.
12-17—**White Sulphur Springs, W. Va.** Society of Automotive Engineers, summer meeting.
20-24—**Atlantic City, N. J.** American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall.

**JULY**

3—**France.** Grand Prix Automobile Race.
5- 9—**Southampton, England.** Commercial Car Show.
9-10—**Belgium.** Grand Prix Automobile Race
17—**Germany.** Grand Prix Automobile Race.
20-22—**Llandrindod, Wales.** Commercial Car Show.

**OCTOBER**

3- 7—**Washington, D. C.** National Safety Council, meeting.
3- 7—**Buffalo, N. Y.** National Metal Exposition, 174th Regiment Armory. W. H. Eisenman, 7016 Euclid Ave., Cleveland, director.
3- 7—**Buffalo, N. Y.** National Metal Congress. Sponsored by American Society for Steel Treating, with cooperation of American Society of Mechanical Engineers, Institute of Metals and Iron and Steel Divisions of American Institute of Mining and Metallurgical Engineers, American Welding Society, Wire Association.
13-22—**London, England.** Olympia Show.

## AMERICAN HAMMERED AWARDS ESSAY PRIZES

**New York,** April 22.—The judges of the American Hammered Contest met at the New Yorker Hotel recently to select the winners of the $10,000 essay contest.

The winner of the first prize of $5,000 was William R. Naylon, 1721 Burgess Road, Cleveland, O.; the second prize went to Lieut. H. N. Toftoy, West Point, N. Y., and the third prize was won by Wallace Linville, Apartment 205, 760 North Hoover, Los Angeles, Cal.

The next ten prizes of $100 each were won by John M. Bonbright, 743 Van Dyke Ave., Detroit, Mich.; R. L. Payne, General Ordonez 9-2, Cartagena, Spain; L. A. Hanson, 116 West End Ave., Ridgewood, N. J.; Joe Rund, 1626 North College St., Decatur, Ill.; Martin R. Cordes, 6511 Chapin Place, Seattle, Wash.; William G. Calkins, 2710 Collingswood Ave., Detroit, Mich.; F. E. Nolen, Colyear Motor Sales Company, 1222-28 South Hill St., Los Angeles, Cal.; Lieut. D. T. Giles, U. S. Naval Engineering Experiment Station, Annapolis, Md.; William H. Campbell, 3533 Brooklyn Ave., Kansas City, Mo., and O. F. Anderson, 1078 East Wood St., Decatur, Ill.

One hundred others from all parts of the world were named as winners of $25 prizes.

## NEW JERSEY CHAPTER ELECTS RUBINE HEAD

**Newark, N. J.,** April 22.—New Jersey Chapter, Institute of Scrap Iron and Steel, has elected Bernard Rubine to succeed James J. Brady as president. Others elected are: Vice-presidents, Meyer Lowenstein, Julius Isaac and Arthur Reichman; treasurer, Frank Gans; secretary, Murray Kunin; chairman of the executive committee, Frank Conty, and members of the executive committee, Patrick Bovasso, Dominick Gloscia and Angelo Claps.

Prior to the elections Michael V. Bonomo, chairman of the special committee on merging with the New York State Chapter, reported that "While we have been honored by having the New York Chapter ask us to unite with them, the best thing for both chapters, in our opinion, is to keep their own identity."

### INDIANA STANDARD OIL TO SELL FOREIGN WELLS

**Chicago,** April 22.—Edward G. Seubert, president Standard Oil Company of Indiana, has announced that an agreement in principle has been made to sell the foreign properties of its subsidiary, the Pan-American Petroleum and Transport Company, to Standard Oil Company of New Jersey. He prophesied a reorganization of the foreign properties and said the increase in his company's crude supply in this country eliminates former requirements for reserve supply from Mexico and Venezuela.

# FINANCIAL NEWS

### ELECTRIC STORAGE BATTERY

**Camden,** April 22.—At the annual meeting of stockholders of Electric Storage Battery Company directors were re-elected.

In reply to a question of a stockholder who asked as to company's policy on dividend payments, John R. Williams, president, said:

"That is a matter that can only be decided by the board of directors. However, unless conditions become deplorably worse, which I do not anticipate, I see no reason to contemplate any change from our liberal policy in our dividend for the next quarter.

"Business for the second quarter is as good as, if not slightly better than, in the first quarter, so that the prospects of a dividend in the second quarter are as good as in the first quarter."

Mr. Williams told the stockholders that the company's financial position is as good today as it was at the close of 1931 as revealed in the balance sheet. He said that the stock has a book value of about $39 a share after allowing for a liberal depreciation policy. Net current assets are equal to about $25 a share and cash and liquid securities, valued at today's market price, are equal to between $13 and $14 per share. Mr. Williams said that, taking the whole portfolio of the company's investments, they show a shrinkage even at present market values of not more than 12 per cent.

### ART METAL WORKS

**New York,** April 22.—Report of Art Metal Works, Inc., and subsidiaries for year ended December 31, 1931, shows net loss of $149,380 after expenses, Federal taxes, etc. This figure does not include the losses for the year of $8,021 and $10,900, respectively, of two 100 per cent. owned subsidiaries, nor any amorization of development expenses.

In year ended December 31, 1930, consolidated net profit was $211,496, equivalent to 94 cents a share on 224,835 no-par shares of capital stock. The 1930 figure excluded $10,355 loss of a 100 per cent. owned subsidiary and proportion of loss for the year of a 73 per cent. owned subsidiary.

### OPEL MOTOR WORKS

**Berlin,** April 22.—Adam Opel A. G., with a capital of rm. 60,000,000, almost wholly controlled by General Motors Corporation, declares that the trading returns for 1931 will show a loss, though considerably less than for 1930, when loss was rm. 14,000,000. Both the new small passenger car and truck proved successful. Home sales of cars fell off to 20,000 from 25,000 cars.

Opel is easily the largest producer in Germany, with sales at home twice those of any competitor and exports amounting to two-thirds of total German exports. General Motors agents concentrated efforts on sale of Opel and certain de luxe models. Practically no Chevrolets were sold.

### YOUNSTOWN PAY CUTS

**Youngstown, O.,** April 22.—Salary cuts totaling as much as 37.5 per cent. have been effected in district steel plants as the result of cumulative reductions of the last few months. As of April 1 some producers ordered another cut. Since the wage and salary adjustment program started in October, 1930, technical workers, engineers particularly, have taken share reductions, some now working at 50 per cent. of the 1929 scale.

If spring business develops in the anticipated volume further wage cuts probably will be delayed for a time. Independents will follow U. S. Steel Corporation in the matter of reductions.

### COMMERCIAL SOLVENTS

**New York,** April 22.—Commercial Solvents Corporation reports for the quarter ended March 31: Net profit after depreciation, interest, Federal taxes and reserves, $293,454, equivalent to 11 cents a share on 2,530,174 no par common shares, compared with $537,544, or 21 cents a share on 2,529,873 shares, in first quarter of 1931.

### CHICAGO YELLOW CAB

**Chicago,** April 22.—Chicago Yellow Cab Company, Inc., declared the regular quarterly dividend of 50 cents, payable June 1 to stock of record June 20.

# Production--Engineering--Factory

## *Current Trends in Automotive Engine Design*

By PROF. F. G. BAENDER,
Oregon State College, Presented at Northwest Section, S. A. E. Meeting

There are many ways in which one might discuss trends in design of automotive engines. One might discuss the perfection of balance, the increased physical properties of various metals, the tendency toward more cylinders, more spark plugs, etc. Each and every part of the engine is undergoing changes which affect its running qualities, its weight, its general appearance, its accessibility, its size, its freedom from vibration and noise and its acceleration.

Of the many interesting developments as outlined above, I shall confine myself primarily to that development which has been so pronounced within the past year or two, and which deals with the increased acceleration of the automobile. In order that we may understand better the term acceleration, I will say that it is called by various names. Perhaps such terms as "pick-up," "snappiness," "performance" and "getaway" would be more significant and convey better the meaning of acceleration.

Before we attempt to describe just what has been done to increase acceleration, it may be well to inquire into a few of the fundamental mathematical concepts underlying the general theory of heat engines, as well as those pertaining to the theory of acceleration.

It is evident that a better understanding will result if the theory underlying the construction of the engine is first explained.

In so far as acceleration is concerned, that can be explained in a few words. The mathematics is rather simple. If we represent the mass of a body by (M) and its acceleration by (a), and the force producing the acceleration by (F), then the fundamental equation is:

$$F = Ma$$

In this equation, applied to the automobile—the force (F) is the turning effort of the engine, the mass (M) is the entire weight of the car and (a) is the acceleration, pick-up, snappiness—or any other word you care to use. It must be understood, however, that the turning effort is considered as that force which ultimately reaches the rear wheels—or the front wheels in those cars using the front wheel drive.

Since it is apparently such a simple equation to deal with, and since it looks so easy to design a car with wonderful acceleration, one wonders why the delay in giving cars much greater acceleration than they now have.

It is evident that for a car of a fixed weight or mass that the acceleration will increase directly as the force increases provided, however, that nothing else comes into the picture to spoil that relationship. As we progress in this paper, we shall discuss various influences that affect this simple relationship. We will attempt to discuss the problems with which the designers of automobiles have to wrangle. Assuming for the moment that nothing else interferes, it would be a simple matter to put a larger engine into a car and therefore increase the acceleration to any extent desired. In a measure, such argument is sound, and within certain limits it works very well. The trouble is, the limits are too small and produce results for only a small increase in the power of the engine. This with the proviso, however, that the increased force or power was obtained by the increase in size of the engine.

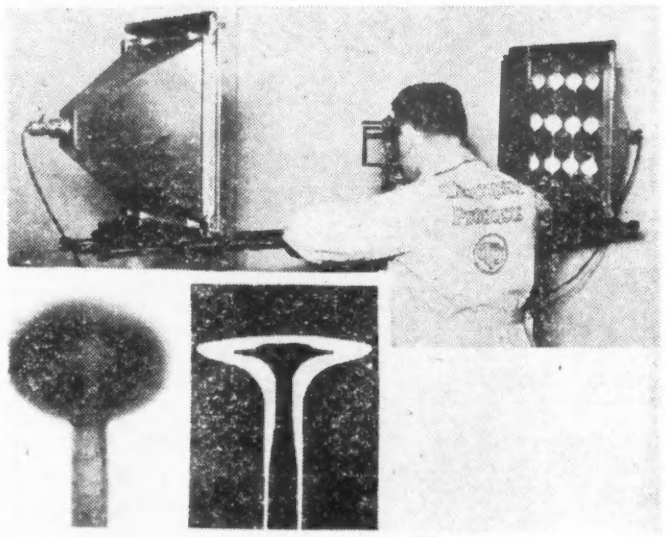
In discussing engineering trends in design, it may be interesting to know something about the cause of the trends and the governing thoughts of the designing engineers.

In many instances public demands furnish the motive power for the trends. A manufacturer naturally will remain contented and happy so long as the public is satisfied with his product and buys it generously. Therefore it is only because the public refuses his goods that the maker decides that he had better revamp his product in order to again satisfy his customers. If all makers were equally content with their sales, progress would be slow, but some maker gets an inspiration, redesigns his car, adds a little performance and at once the entire driving public will demand that performance. Of course, this same argument holds for body styles, shock absorbers, free-wheeling units, ride control, syncro-mesh, etc.

So much for the causes. Now let us assume that a manufacturer has a model which lacks "pep." This he will soon learn after the public has had an opportunity to test it, even in spite of the many tests that his car is supposed to have had on the proving grounds. He must make an improvement in performance or else

(Continued on Page 6)

## X-Ray Device Developed By Thompson Products



STEEL WALLS ARE RENDERED TRANSPARENT as glass by this X-ray examining machine used for aircraft valve inspection by Thompson Products, Inc., Cleveland. It creates a depth image (lower left) of the hollow head aircraft valve shown on the right, by means of which wall thickness and chamber symmetry can be determined

**Thompson Products, Inc., Cleveland, O., has developed an X-ray device for giving accurate information as to the condition and symmetry of the sealed steel chamber within a hollow valve.**

The condition and symmetry of the sealed steel chamber within a hollow aircraft valve no longer need be guessed at with the application of the X-ray to a new inspection process now in regular practice at Thompson Products, Inc., Cleveland, O.

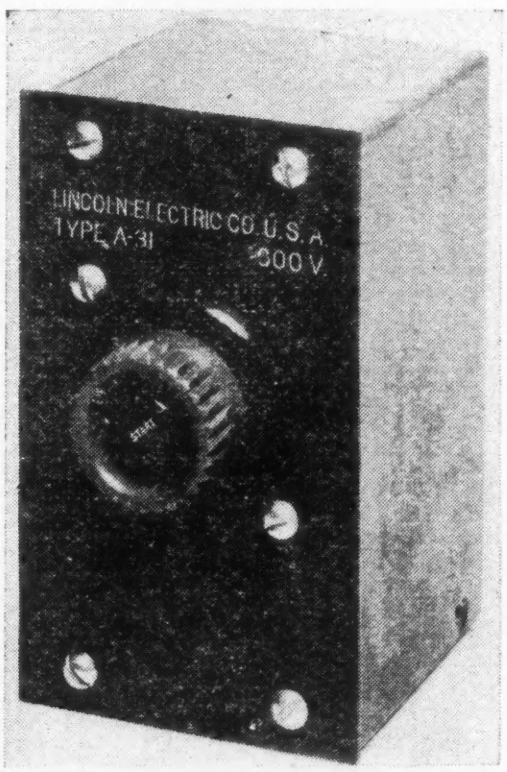
By using the X-ray and a specially designed stereoscope in combination, it is possible to create a depth image of the valve, and then gaze through the steel walls as though transparent, discerning flaws and irregularities in the same manner as air holes are seen in a cake of ice.

Chamber symmetry, wall thickness and steel condition are highly important items in the successful operation of a valve. This made it necessary that some means be devised whereby these items could be accurately determined, and the X-ray was applied to inspection.

Following a highly mechanical specialized inspection after manufacture, the valves are X-rayed in multiple numbers from two different angles. The plates are then developed in sets and placed in a stereoscope manufactured by General Electric X-ray Corporation. Proper focus is obtained, and each valve appears in phantom while an inspector carefully examines e ch image for chamber symmetry, foreign material in the cavity, flaws or defects in the steel.

Where the hollow-head valve will tend to improve engine efficiency and performance, the new inspection process adds to reliability by revealing mechanical defects in valves which were formerly undetectable.

## *Improved Lincoln Push Button*



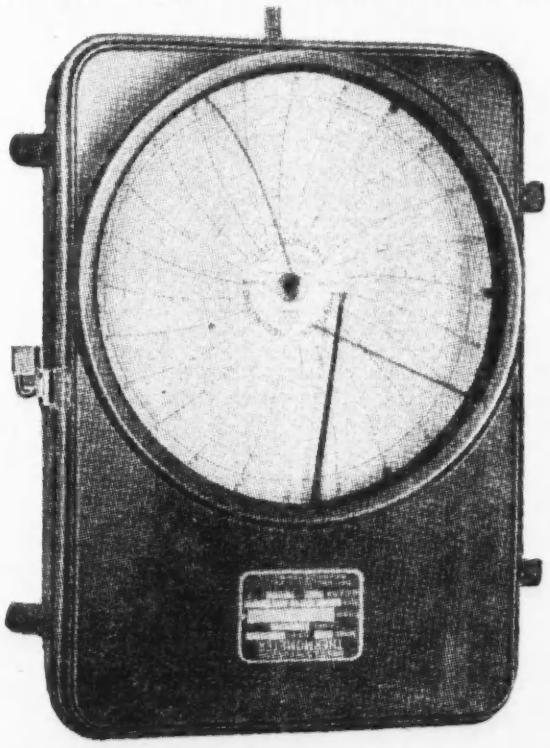

**The Lincoln Electric Company, Cleveland, O., announces number of improvements in their safety push button introduced to the trade early last year.**

A feature of this push-button switch is that the start button is inside of the stop button, as shown in the accompanying photograph. The stop button can be operated from any angle by merely striking the front of the control box with the flat of the hand, but the start button must be operated with the finger. With the new push button, the stop button can be locked in the off position by pushing it in and twisting it to the right. Heavy springs prevent accidental operation of either button when not locked.

It is claimed the button will handle the heaviest control circuits up to 600 volts A. C. or D. C., because the contact opening is larger than usual. This is because the contacts use extra heavy double break solid copper contacts which have a positive wiping action. Contacts are inclosed in a dustproof, cold-molded asbestos case.

The button is self-contained and need not be taken apart or even removed from the box cover for wiring. All of the terminals are clearly marked and brought out of the case to the back, where they are easily accessible. The new safety switch is known as type A-31.

## New Bristol Instrument Case



**The Bristol Company, Waterbury, Conn., has developed a new instrument case for its pressure, temperature and other recorders. This case is rectangular in shape. It is pressure cast of corrosion resisting aluminum alloy and a smooth surface which permits a finish to be used either black, white or aluminum.**

The case is stated to be thirty-five per cent. lighter in weight and unusually rigid and strong. Only a single toggle clamp is needed for locking the door tightly. This clamp, it is stated, is both quick opening and quick closing.

A permanently resilient sponge rubber cord gasket is employed to make the case dust proof, moisture proof and fume proof. Substantial hinges are fitted. The glass window is held in place by a sprung metal ring. An inverted pen arm is standard. Single or multiple records may be had. The case is designed for surface or flush mounting, front, top or back connected.

## Socony-Vacuum Brings Out New Motor Oil

**The Standard Oil Company of New York, Inc., announces marketing of a new product, the new Mobiloil, which goes on sale at more than 30,000 dealers in New York and New England. The new Mobiloil supplants Socony dewaxed motor oil and the former Mobiloil, lubricants of the Standard Oil Company of New York, Inc., and the Vacuum Oil Company, Inc., respectively. It is the first product to result from the recently merged Socony-Vacuum Corporation.**

The new lubricant is in line with the other unusual activities in the automotive field in the way of new developments planned to give the car owner greater value and greater economy. The specifications for the new product were worked out by Socony-Vacuum engineers in co-operation with the engineers of the leading automobile manufacturers, including the designers of the engines used in the latest models.

It is stated that much of this joint laboratory work was done in the automobile plants. Subsequent tests duplicated a wide range of operating conditions with both the new and the older model engines. Through this co-operation of the engine designers and the lubricating engineers the latter were enabled to keep their own development work in pace with the latest engine changes, meeting the greater demands imposed on a lubricant by the higher compression, added cylinders and other engine developments and securing greater efficiency of operation with the engines of previous years.

# PRODUCTION STARTED ON $2,000,000 BUS ORDER FOR GREYHOUND

(Continued from Page 1)

rate of three a day at the present time.

Absolutely no persons will be employed because of the order, it was stated from offices of the personnel division. Employment has been as low as 40 per cent. of the factory sent figure. It is hoped to build this up to 80 per cent. employment, using only men now on the pay roll and hiring no outside men.

Production has also started on an order for 500 truck bodies for the United States Post Office Department. Changes in factory personnel, following appointment of new officials, are still being made.

# FRANKLIN SHIPPING NEW 12-CYL. MODELS

(Continued from Page 1)

means of considerable accelerated employment at the Franklin plant recently, and in this connection the new body-building department has been employing 150 skilled workers.

Many of these men are new recruits to Syracuse industry, having been enlisted from body-building centers in New England and the Middle West.

## FOREIGN TRADE OPPORTUNITIES

**Washington, D. C., April 22.—Foreign automotive trade opportunities just announced by the automotive division of the Bureau of Foreign and Domestic Comemrce of the Department of Commerce are listed below.**

Additional information may be obtained from the bureau and its district and co-operative offices by duly registered firms or individuals upon written request, giving the opportunity number.

**57143**—Havre, France; agency for automobile accessories.

**57047**—Berlin, Germany; agency or purchase of automobile accessories, especially electric appliances.

**57095**—Moose Jaw, Canada; agency or purchase of automobile garage equipment.

**57046**—Brussels, Belgium; agency for automobile spare parts.

**57176**—Rosario, Argentina; purchase of automobile spare parts.

**57048**—Colombo, Ceylon; agency for automobile top bows.

**57124**—Winnipeg, Canada; agency for purchase of automobile piston rings.

### COL. GREEN PROMOTED BY G. M. TRUCK COMPANY

**Pontiac,** April 22.—Appointment of Col. George A. Green, formerly vice-president in charge of engineering of General Motors Truck Company, to the position of vice-president in charge of operations was announced here today from the offices of Paul W. Seiler, president.

# MAJOR SPECIFICATIONS AND MECHANICAL DETAILS

| Make and Model | Weight—5-P. Sedan | Wheel Base | Engine Make | Thermostat Used | Valve Arrangement | Cylinders | Bore and Stroke | Piston Disp. | Compression Ratio | Tax H. P. | Brake. H.P. and Peak R. P. M. | Pist. Make or Material | No. Main Br. | Oil Purifier | Fuel Cleaner | Carburetor | Air Cleaner |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Auburn 8-100** | —— | 127-136 | Lyc | Dole | L | 8 | 3 x4¾ | 268.6 | 2.56 | 28.8 | 98@3400 | *Alum | 5 | Pur | No | Str | No |
| **Auburn 12-160** | —— | 133 | Lyc | Dole | O | 12 | 3⅛x4¼ | 391.0 | 5.50 | 46.8 | 160@3400 | *Alum | 4 | Pur | Ste | Str | — |
| **Austin** | §1130 | 75 | Own | —— | L | 4 | 2.2x3 | 45.6 | 5.10 | 7.8 | 13@3000 | Alum | 2 | — | — | Til | No |
| **Buick 32-50** | 3450 | 114 | Own | Bish-Bab | O | 8 | 2⅞x4¼ | 230.4 | 4.65 | 27.61 | 78@3200 | CI | 5 | AC | AC | Mar | AC |
| **Buick 32-60** | 3930 | 118 | Own | Bish-Bab | O | 8 | 3⅛x4⅝ | 272.6 | 4.63 | 30.02 | 90@3000 | CI | 5 | AC | AC | Mar | AC |
| **Buick 32-80** | 4450 | 126 | Own | Bish-Bab | O | 8 | 3⅜x5 | 344.8 | 4.40 | 35.12 | 104@2900 | CI | 5 | AC | AC | Mar | AC |
| **Buick 32-90** | 4565 | 134 | Own | Bish-Bab | O | 8 | 3⅜x5 | 344.8 | 4.40 | 35.12 | 104@2900 | CI | 5 | AC | AC | Mar | AC |
| **Cadillac 355 B** | —— | 134-140 | Own | Har | L | 8 | 3⅝x4⅛ | 353.0 | 5.38 | 36.4 | 115@3000 | CI | 3 | AC | AC | Own | AC |
| **Cadillac 370 B** | —— | 134-140 | Own | Har | O | 12 | 3⅛x4 | 368.0 | 5.30 | 46.9 | 135@3400 | CI | 4 | Cuno | AC | DL | AC |
| **Cadillac 452 B** | —— | 143-149 | Own | Har | O | 16 | 3 x4 | 452.0 | 5.36 | 57.5 | 165@3400 | CI | 5 | Cuno | AC | DL | AC |
| **Chevrolet** | —— | 109 | Own | No | O | 6 | 3⅛x3¾ | 194 | 5.20 | 26.3 | 60@3000 | CI | 3 | — | — | Car | AC |
| **Chrysler 6** | 3120 | 116 | §Own | Yes | L | 6 | 3¼x4½ | 223.9 | 5.35 | 25.35 | 82@3400 | *Alum | 4 | Pur | Yes | B & B | Yes |
| **Chrysler 8** | 3860 | 125 | §Own | Yes | L | 8 | 3¼x4½ | 298.6 | 5.20 | 33.80 | 100@3400 | *Alum | 5 | Pur | Yes | Str | Yes |
| **Chrysler Imp. 8** | —— | 135 | §Own | Yes | L | 8 | 3½x5 | 384.8 | 5.20 | 39.20 | 125@3200 | *Alum | 9 | Pur | Yes | Str | Yes |
| **Chrysler Imp. 8 cus.** | —— | 146 | §Own | Yes | L | 8 | 3½x5 | 384.8 | 5.20 | 39.20 | 125@3200 | *Alum | 9 | Pur | Yes | Str | Yes |
| **Cord (Fr. Wh. D.)** | 4620 | 137½ | Lyc | Dole | L | 8 | 3¼x4½ | 298.6 | 5.25 | 33.8 | 115@3300 | *Alum | 5 | Pur | AC | Sch | No |
| **De Soto Six** | 3008 | 113 | §Own | Yes | L | 6 | 3¼x4¼ | 211.5 | 5.35 | 25.35 | 75@3400 | *Alum | 4 | Pur | Yes | B & B | Yes |
| **De Vaux 6-80** | 2810 | 114 | Hall | Dole | L | 6 | 3⅜x4 | 214.7 | 5.20 | 27.34 | 75@3600 | Alum | 4 | — | Yes | Til | AC |
| **Dodge Six D L** | 3084 | 114¼ | §Own | Yes | L | 6 | 3¼x4⅜ | 217.7 | 5.35 | 25.35 | 79@3400 | Alum | 4 | Pur | Yes | Car | Yes |
| **Dodge Eight D K** | 3488 | 122 | §Own | Yes | L | 8 | 3¼x4¼ | 282.1 | 5.20 | 33.80 | 90@3400 | Alum | 5 | Pur | Yes | Str | Yes |
| **Essex-Gr. Su. 6** | —— | 113 | †Own | —— | L | 6 | 2⅞x4¾ | 193.0 | 5.50 | 20.7 | 70@3200 | Alum | 3 | No | Ste | Mar | AC |
| **Ford A** | 2375 | 106½ | Own | —— | L | 4 | 3⅜x4¼ | 200.5 | 4.22 | 24.03 | 40@2200 | Alum | 3 | — | — | Zen | — |
| **Ford V8** | —— | 106½ | Own | —— | — | 8 | 3⅛x3⅜ | 221.0 | 5.50 | 30.0 | 65@3400 | — | 3 | — | — | — | — |
| **Franklin Airman** | —— | 132 | *Own | Ful | O | 6 | 3½x4¾ | —— | 5.10 | —— | 100@3100 | *Alum | 7 | Pur | Yes | Str | Yes |
| **Franklin V-12** | —— | 144 | *Own | Ful | O | 12 | 3¼x4 | 398.0 | 5.12 | —— | 150@3100 | *Alum | 7 | Pur | Yes | Str | Yes |
| **Graham 6** | —— | 113 | Own | Yes | L | 6 | 3⅛x4½ | 207 | 5.45 | 23.4 | 70@3200 | *Alum | 7 | — | AC | Sch | AC |
| **Graham, Bl-Str.** | 366 | 123 | Own | Bish-Bab | L | 8 | 3⅛x4 | 245.4 | 6.50 | 31.25 | 90@3400 | *Alum | 5 | AC | AC | DL | AC |
| **Hudson Greater 8** | —— | 119-126-132 | †Own | —— | L | 8 | 3 x4½ | 254.1 | 5.80 | 28.8 | 101@3600 | Alum | 5 | No | Ste | Mar | AC |
| **Hupmobile 216** | —— | 116 | Own | Bish-Bab | L | 6 | 3⅜x4¼ | 228.1 | 5.00 | 27.34 | 75@3200 | *Alum | 4 | ** | Ste | Str | AC |
| **Hupmobile 222** | 3580 | 122 | Own | Bish-Bab | L | 8 | 2⅞x4⅜ | 250.7 | 5.40 | 27.61 | 93@3200 | Alum | 5 | Pur | Ste | Str | AC |
| **Hupmobile 226** | 3755 | 126 | Own | Bish-Bab | L | 8 | 3⅛x4¾ | 279.9 | 5.47 | 30.10 | 103@3200 | Alum | 5 | Pur | Ste | Str | AC |
| **La Salle 345 B** | —— | 130-136 | Own | Har | L | 8 | 3⅜x4⅛ | 353.0 | 5.38 | 36.4 | 115@3000 | CI | 3 | AC | AC | Own | AC |
| **Lincoln V-8** | 5430 | 136 | Own | Yes | L | 8 | 3½x5 | 384.0 | 5.23 | 39.2 | 125 | Alum | 5 | No | AC | Str | AC |
| **Lincoln V-12** | 5750 | 145 | Own | Yes | L | 12 | 3¼x4½ | 448.0 | 5.25 | 50.7 | 150@3400 | Alum | 7 | No | AC | Str | AC |
| **Marmon 8** | 3500 | 125 | Own | Yes | L | 8 | 3¼x4¾ | 315.2 | 5.50 | 33.8 | 125@3400 | Alum | 5 | Flo | — | — | — |
| **Marmon 16** | 5360 | 145 | Own | Pines | O | 16 | 3⅛x4 | 490.8 | 6.00 | 62.5 | 200@3400 | Alum | 5 | † | AC | Str | AC |
| **Nash Big Six** | 3200 | 116 | Own | Bish-Bab | L | 6 | 3⅛x4⅜ | 201.3 | 5.10 | 23.4 | 70@3000 | *Alum | 7 | Pur | AC | Str | AC |
| **Nash Stand. Eight** | 3400 | 121 | Own | Bish-Bab | L | 8 | 3 x4⅜ | 247.4 | 5.10 | 28.8 | 85@3200 | *Alum | 9 | Pur | AC | Str | AC |
| **Nash Spec. Eight** | 3870 | 128 | Own | Bish-Bab | O | 8 | 3⅛x4¼ | 260.8 | 5.25 | 31.2 | 100@3400 | *Alum | 9 | Pur | AC | Str | AC |
| **Nash Adv. Eight** | 4350 | 133 | Own | Bish-Bab | O | 8 | 3⅜x4½ | 322.0 | 5.25 | 36.4 | 125@3600 | *Alum | 9 | Pur | AC | Str | AC |
| **Nash Ambas. Eight** | —— | 142 | Own | Bish-Bab | O | 8 | 3⅜x4½ | 322.0 | 5.25 | 36.4 | 125@3600 | *Alum | 9 | Pur | AC | Str | AC |
| **Oldsmobile F-32** | 3035 | 116½ | Own | No | L | 6 | 3⅛x4⅛ | 213.3 | 5.80 | 26.3 | 74@3200 | CI | 4 | AC | AC | Str | AC |
| **Oldsmobile L-32** | 3165 | 116½ | Own | No | L | 8 | 3 x4¼ | 240.3 | 5.90 | 28.8 | 87@3350 | CI | 5 | AC | AC | Str | AC |
| **Packard Twin Six** | 5225 | 142-147 | Own | Yes | L | 12 | 3⅞x3½ | 390.0 | 6.00 | 50.6 | 150@3600 | *Alum | 4 | No | Yes | Own | AC |
| **Packard Stan. 8** | 4570 | 130-137 | Own | Yes | L | 8 | 3⅛x5 | 320.0 | 6.00 | 32.5 | 110@3200 | *Alum | 9 | Yes | Yes | Own | AC |
| **Packard De L. 8** | 5045 | 142-147 | Own | Yes | L | 8 | 3½x5 | 384.8 | 6.00 | 39.2 | 135@3200 | *Alum | 9 | Yes | Yes | Own | AC |
| **Packard Light 8** | 4115 | 127¾ | Own | Yes | L | 8 | 3⅜x5 | 320.0 | 6.00 | 32.50 | 110@3200 | *Alum | 9 | Yes | Yes | Own | AC |
| **Peerless De L. Mas.** | 4521 | 125 | Con | Bish-Bab | L | 8 | 3⅜x4½ | 322 | 5.00 | 36.45 | 115@3200 | *Alum | 5 | Pur | AC | Sch | AC |
| **Peerless Custom 8** | 4766 | 138 | Con | Bish-Bab | L | 8 | 3⅜x4½ | 322 | 5.00 | 36.45 | 120@3200 | *Alum | 5 | Pur | AC | Sch | AC |
| **Pierce-Arrow 54** | —— | 137-142 | Own | Pines | L | 8 | 3½x4¾ | 366 | 5.05 | 39.2 | 125@3000 | *Alum | 9 | Pur | Ste | Str | AC |
| **Pierce-Arrow 52** | —— | 142-147 | Own | Pines | L | 12 | 3⅜x4 | 429 | 5.05 | 54.6 | 150@3200 | *Alum | 7 | Pur | Ste | Str | AC |
| **Pierce-Arrow 53** | —— | 137-142 | Own | Pines | L | 12 | 3¼x4 | 398 | 5.05 | 50.7 | 140@3200 | *Alum | 7 | Pur | Ste | Str | AC |
| **Plymouth** | 2875 | 112 | Own | No | L | 4 | 3⅜x4¾ | 196.1 | 4.90 | 21.03 | 65@3000 | Alum | 3 | Yes | AC | B&B | Yes |
| **Pontiac 6** | —— | 114 | Own | —— | L | 6 | 3⅛x3⅞ | 200.0 | 5.10 | 26.3 | 65@3200 | CI | 3 | — | AC | Mar | Yes |
| **Pontiac V-8** | —— | 117 | Own | —— | H | 8 | 3⅛x3⅜ | 251.0 | 5.20 | 37.3 | 85@3200 | CI | 3 | — | AC | Mar | Yes |
| **Reo Fly. Cloud "S"** | —— | 117 | Own | —— | — | 6 | 3⅛x5 | 230.0 | 5.30 | — | 80@3200 | Lo-Ex | 7 | Yes | Yes | Yes | Yes |
| **Reo Royale 8-35** | 4650 | 135 | Own | Pines | L | 8 | 3⅜x5 | 358 | 5.30 | 36.48 | 125@3300 | Alum | 9 | Han | AC | Sch | Own |
| **Reo Royale 8-31** | 4375 | 131 | Own | Pines | L | 8 | 3⅜x5 | 358 | 5.30 | 36.48 | 125@3300 | Alum | 9 | Han | AC | Sch | Own |
| **Reo 8-21** | 3610 | 121 | Own | Yes | L | 8 | 3 x4¾ | 268.6 | 5.37 | 28.8 | 90@3300 | *Alum | 5 | Han | — | Sch | Un |
| **Reo 6-21** | 3525 | 121 | Own | Yes | L | 6 | 3⅜x5 | 268.3 | 5.30 | 27.3 | 85@3200 | Alum | 7 | Han | — | Sch | Un |
| **Reo Fly. Cloud 6-25** | 3950 | 125 | Own | Yes | L | 6 | 3⅜x5 | 268.3 | 5.30 | 27.34 | 85@3200 | Alum | 7 | Han | V S | Sch | Un |
| **Reo 8-25** | 4050 | 125 | Own | Yes | L | 8 | 3 x4¾ | 268.6 | 5.37 | 28.8 | 90@3300 | *Alum | 5 | Han | V S | Sch | Un |
| **Rockne 6-65** | 2595 | 110 | Own | Dole | L | 6 | 3⅛x4⅛ | 189.8 | 5.20 | 23.4 | 66@3200 | CI | 4 | — | Ste | Str | No |
| **Rockne 6-75** | 3000 | 114 | Own | Dole | L | 6 | 3¼x4⅛ | 205.3 | 5.10 | 25.4 | 72@3200 | CI | 4 | — | AC | Str | No |
| **Studebaker 6-55** | 3170 | 117 | Own | Dole | L | 6 | 3¼x4⅝ | 230.0 | 5.00 | 25.4 | 80@3200 | CI | 4 | No | Ste | Str | No |
| **Studebaker Dict. 62** | 3240 | 117 | Own | Dole | L | 8 | 3⅛x3¾ | 221.0 | 5.00 | 30.0 | 85@3200 | CI | 9 | Pur | Ste | Str | AC |
| **Studebaker Com. 71** | 3545 | 125 | Own | Dole | L | 8 | 3⅛x4¼ | 250.4 | 5.15 | 30.0 | 101@3200 | *Alum | 9 | Pur | Ste | Str | AC |
| **Studebaker Pres. 91** | 4260 | 135 | Own | Dole | L | 8 | 3½x4⅜ | 337.0 | 5.10 | 39.2 | 122@3200 | *Alum | 9 | Han | Ste | Str | AM |
| **Stutz LAA** | 4383 | 127½ | Own | —— | O | 6 | 3⅜x4½ | 241.5 | 5.50 | 27.3 | 85@3150 | *Alum | 7 | Pur | AC | Zen | Un |
| **Stutz SV-16** | 4885 | 134½-145 | Own | —— | O | 8 | 3⅜x4½ | 322 | 5.50 | 36.4 | 113@3300 | *Alum | 9 | Pur | AC | Zen | AM |
| **Stutz DV 32** | 5281 | 134½-145 | Own | Bish-Bab | O | 8 | 3⅜x4½ | 322 | 5.10 | 36.4 | 156@3900 | *Alum | 9 | Pur | Ste | Sch | AC |
| **Willys-Ov'land 6-90** | 2824 | 113 | Own | —— | L | 6 | 3¼x3⅞ | 193.0 | 5.26 | 25.35 | 65@3400 | CI | 4 | No | AC | Til | Til |
| **Willys-Ov'land 8-88** | —— | 121 | Own | —— | L | 8 | 3⅛x4 | 245.4 | 5.26 | 31.25 | 80@3200 | CI | 5 | No | AC | Til | AC |
| **Willys-Kni. 66-D** | —— | 121 | Own | —— | K | 6 | 3⅜x4¾ | 255.0 | 5.50 | 27.34 | 87@3200 | *Alum | 7 | Pur | Til | Til | AC |
| **Willys-Knight 95** | —— | 113 | Own | —— | K | 6 | 2⅞x4⅜ | 177.9 | 5.55 | 20.70 | 60@3400 | *Alum | 7 | Pur | AC | Til | Yes |

# Current Automotive Trends In Engine Design

(Continued from Page 5)

his sales will dwindle to the point where profit is all gone. In making this improvement he asks his designing engineers for a new design. The reasoning and deductions which the designing department have to consider must be based upon the fundamental concepts of mechanics and heat engineering.

It is the aim of this paper to present a few of these fundamental concepts in order that we may better understand the reasons for the particular trends which are now so self-evident.

Let it be recognized, first of all, that any heat engine has only one source of energy, and that comes from the heat energy liberated when some fuel such as gasoline or fuel oil is burned with oxygen. It must be recognized further, that from the instant the fuel is burned losses begin and these losses manifest themselves in heat escaping into the cooling water; radiation losses; heat transmitted to the crank case oil and also by the escape of gases past the piston rings and through leaky valves.

The fundamental problem with which the designing engineer must cope is one in which the prime consideration must be to burn more fuel and burn it efficiently. There are several possibilities by which this may be accomplished. First, he may decide to increase the bore of the cylinders; second, he may increase the length of the stroke, or he may increase both bore and stroke.

Third, he may increase the number of cylinders without increasing their size. Fourth, he may increase the speed of the engine. Fifth, he may increase the columetric efficiency by decreasing manifold resistance or increasing the size of the intake valves. Sixth, he may add a supercharger which will allow more fuel burned per cylinder, or, seventh, he may increase the compression ratio. And, again, he may use various combinations of the above possibilities.

But if we trace back through the development of the auto engine, we find that the development has passed through all the stages as outlined and in about the order named.

Years ago, while the automobile was still in its infancy, we had the old, slow motors, with bore and stroke about alike, and with very little "pep" displayed. During the succeeding years speeds went up, the bore became relatively smaller, yet the motors became more powerful. Then we began adding more cylinders and still further increasing the rotative speed. Each change was accompanied by an increase in power output.

With increased speeds volumetric efficiency dropped rapidly. Power output decreased accordingly. It became necessary, therefore, to restore volumetric efficiency, and this led us through many improvements in manifold design.

Also the inlet valves had to be enlarged and carburetors redesigned to reduce friction. In some cases two inlet valves were installed, because it is recognized that it is much easier to deal with the inertia forces of two small valves than with one large one.

Then came the supercharger. Much work has been done in trying to develop a suitable supercharger, but to date no manufacturer of automobiles has developed a suitable one, unless we except the Franklin car, which is equipped with one on the 1932 model.

Each and every development so far enumerated has for its basic concept some well-known mathematical principle, and each development has been a step forward in adding performance to the car.

But, curious as it may seem, each development has proceeded about as far as it is possible to go with that development. This meant then that further improvement would have to be accomplished along another line. Take the matter of speed. It is not likely that the future motors will turn over any faster than at present. There seems to be a limit in this direction. Inertia forces, unbalance, valve action, lubricating problems, heat control and many other factors put practical limits on rotative speed.

The number of cylinders also is limited, and it is likely that there will be but few cars with more than eight cylinders.

The size of the cylinders is also limited by heat control and lubricating problems, and, therefore, the limit in this direction is reached. Engines of large bore and of a given design and construction reach higher combustion temperatures than those of smaller bore. On account of the relationship between combustion temperatures, efficiencies and tendencies to preignition, there is an economic limit to cylinder sizes.

(To Be Continued)

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

# OF PRESENT AMERICAN PASSENGER CAR MODELS

| Make and Model | Front End Drive | Ignition System | Gen. and Starter | Clutch | Transmission Make | Transmission Speeds | Transmission Type | Universals | Rear Axle | Ratio | Brakes | Steering Gear | Springs Rear | Spring Shackles | Chassis Lubric. | Tires |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Auburn 8-100 | Chain | Del-R | Del-R-S | Long | D | 3 | SM-LGS-F | U | Col | *4.70 | M | Ross | S 56¾ | Own | Bijur | 17x6.00 |
| Auburn 12-160 | Link | Del-R | *Del-R-S | Long | D | 3 | SM-LGS-F | M | Col ½ | *4.55 | Bendix | Ross | S 56¾ | Own | Bijur | *17x6.00 |
| Austin | Gear | Aut-L | *Aut-L | Rock | WG | 3 | — | S | Sal ½ | 5.25 | M | Say-B | Cant | Own | Al-Z | 18x3.75 |
| Buick 32-50 | Tex | Del-R | Del-R | *Own | O | 3 | SM-BW-F | O | Own ½ | 4.60 | Own | Sag | S 56 | Tryon | Al-Z | 18x5 50 |
| Buick 32-60 | Tex | Del-R | Del-R | *Own | O | 3 | SM-BW-F | O | Own ¾ | 4.54 | Own | Sag | S 55¼ | Own | Al-Z | 18x6.00 |
| Buick 32-80 | Tex | Del-R | Del-R | *Own | O | 3 | SM-BW-F | O | Own ¾ | 4.27 | Own | Sag | S 58⅞ | Own | Al-Z | 18x7.00 |
| Buick 32-90 | Tex | Del-R | Del-R | *Own | O | 3 | SM-BW-F | O | Own ¾ | 4.27 | Own | Sag | S 58⅞ | Own | Al-Z | 18x7.00 |
| Cadillac 355 B | Morse | Del-R | Del-R | Own | O | 3 | SM-F | S | Own ¾ | 4.60 | Own M | Sag | S 58 | Own | Alem | 17x7 00 |
| Cadillac 370 B | Morse | Del-R | Del-R | Own | O | 3 | SM-F | S | Ov n ¾ | 4.80 | Own M | Sag | S 58 | Own | Alem | 17x7.50 |
| Cadillac 452 B | Morse | Del-R | Del-R | Own | O | 3 | SM-F | S | Own ¾ | 4.64 | Own | Sag | S 60 | Own | Alem | 18x7.50 |
| Chevrolet | — | Del-R | *Del-R | Own | O | 3 | SM-F | — | Own ½ | — | — | Sag | S 54 | — | Alem | 18x5.25 |
| Chrysler 6 | Chain | Del-R | Del-R | *— | O | 3 | — F | — | Own ½ | 4.60 | H | Own | S 53⅜ | — | Alem | 18x5.50 |
| Chrysler 8 | Chain | Del-R | Del-R | *— | O | 4 | — F | — | Own ½ | 4.30 | H | Gem | S 54⅝ | — | Alem | 17x6.50 |
| Chrysler Imp. 8 | Chain | Del-R | Del-R | *— | O | 4 | — F | — | Own ½ | 4.10 | H | Gem | S 57½ | — | Al-Z | 17x7.00 |
| Chrysler Imp. 8 Cus. | Chain | Del-R | Del-R | *— | O | 4 | — F | — | Own ½ | 4.10 | H | Gem | S 57½ | — | Al-Z | 17x7.50 |
| Cord (Fr. Wh. Dr.) | Link | Del-R | *Del-R | Long | D | 3 | — | • | Col F | 4.80 | H | Gem | S 62 | Own | Bijur | 18x7.00 |
| De Soto Six | Chain | Del-R | Del-R | *Own | O | 3 | — F | S | Own ½ | 4.62 | H | Own | S 53⅜ | — | Alem | 18x5.25 |
| De Vaux 6-80 | Morse | Aut-L | *Aut-L | Borg | W | 3 | — | S | ‡AD ½ | 4.40 | M | †W | S 54¼ | Tryon | Al-Z | 19x5.25 |
| Dodge Six D L | Chain | Del-R | — | — | O | 3 | — F | — | Own ½ | 4.60 | H | Own | S 54⅞ | — | Al-Z | 18x5 50 |
| Dodge Eight D K | Chain | Del-R | Del-R | *— | O | 3 | — F | — | Own ½ | 4.10 | H | Gem | S 55 | — | Al-Z | 18x6.00 |
| Essex Gr. Su. 6 | Morse | Aut-L | *Aut-L-S | Own | O | 3 | SM-WG-F | S | Own ½ | 4.63 | Bendix | Gem | S 54⅛ | Own | Alem | 18x5.25 |
| Ford A | Var | Own | *Own | Own | O | 3 | — | S | Own ¾ | 3.78 | M | Gem | S-Tr 39 | Own | Al-Z | 19x4.75 |
| Ford V8 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | Al-Z | 18x5.25 |
| Franklin Airman | Chain | Del-R | *Del-R-S | — | W | 3 | SM-BW-F | M | — ½ | 4.73 | H | Gem | El 42 | — | Al-Z | 19x6.50 |
| Franklin V-12 | Chain | Del-R | *Del-R-S | Long | W | 3 | SM-BW-F | M | Col ½ | 4.45 | H | Ross | S 60 | Fafnir | Al-Z | 17x7.50 |
| Graham 6 | Link | Del-R | Del-R | Long | WG | 3 | WG-F | U | Sal ½ | 4.45 | H | Ross | S 54 | ERS | Al-Z | 17x5 50 |
| Graham, Bl.-Str. | Link | Del-R | Del-R | Long | WG | 3 | SM-WG-F | S | Sal ½ | 4.30 | H | Ross | S 54 | ERS | Al-Z | 17x6.00 |
| Hudson Greater 8 | Morse | Aut-L | *Aut-L-S | Own | O | 3 | SM-WG-F | S | Own ½ | 14.63 | Bendix | Gem | S 54⅛ | Own | Alem | *17x6.00 |
| Hupmobile 216 | Chain | Aut-L | *Aut-L-S | Borg | WG | 3 | SM-WG-F | M | Spic ½ | 4.54 | M | Ross | S 53 | Tryon | Al-Z | 18x5 50 |
| Hupmobile 222 | Morse | Aut-L | *Aut-L-S | Borg | WG | 3 | SM-WG-F | U | Own ½ | 4.36 | M | Gem | S 57½ | — | Al-Z | 17x6.00 |
| Hupmobile 226 | More | Aut-L | *Aut-L-S | Long | D | 3 | SM-DG-F | U | Own ½ | 4.36 | M | Gem | S 57½ | — | Al-Z | 17x6.50 |
| La Salle 345 B | Morse | Del-R | Del-R | Own | O | 3 | SM-F | S | Own ¾ | 4.60 | Own M | Sag | S 58 | Own | Alem | 17x7.00 |
| Lincoln V-8 | Chain | Aut-L | Aut-L | Long | O | 3 | SM-F | S | Own F | 4.58 | *Bendix | Own | S 62 | Own | Alem | 18x7.00 |
| Lincoln V-12 | Chain | Aut-L | Aut-L | Long | O | 3 | SM-F | S | Own F | 4.58 | *Bendix | Own | S 62 | Own | Alem | 18x7.50 |
| Marmon 8 | Diam | Del-R | Del-R | *— | — | 3 | SM | S | Spic ½ | 4.08 | Bendix | Ross | S 57 | — | Alem | 18x6.00 |
| Marmon 16 | Diam | Del-R | Del-R | *Rus | M | 3 | SM | S | Spic ½ | 3.78 | Bendix | Ross | S 59½ | — | Alem | 18x7.00 |
| Nash Big Six | Chain | Aut-L | Aut-L-S | Borg | O | 3 | SM-DG-F | O | Own ½ | 4.70 | M | Ross | S 54 | ERS | Alem | 18x5.25 |
| Nash Stand. Eight | Chain | Aut-L | Aut-L-S | Borg | O | 3 | SM-DG-F | O | Own ½ | 4.45 | M | Ross | S 54 | ERS | Alem | 18x5.50 |
| Nash Spec. Eight | Chain | *Aut-L | Aut-L-S | Borg | O | 3 | SM-DG-F | O | Own ½ | 4.43 | Bendix | Gem | S 55¾ | * | Bijur | 17x6.50 |
| Nash Adv. Eight | Chain | *Aut-L | Aut-L-S | Borg | O | 3 | SM-DG-F | O | Own ½ | 4.50 | Bendix | Gem | S 57⅛ | * | Bijur | 18x7.00 |
| Nash Ambas. Eight | Chain | *Aut-L | Aut-L-S | Borg | O | 3 | SM-DG-F | O | Own ½ | 4.50 | Bendix | Gem | S 57⅛ | * | Bijur | 18x7.00 |
| Oldsmobile F-32 | Chain | Del-R | Del-R | Borg | M | 3 | SM-BW-F | S | Own ½ | 4.56 | Bendix | Sag | S 54½ | Tryon | Al-Z | 17x6.00 |
| Oldsmobile L-32 | Chain | Del-R | Del-R | Borg | M | 3 | SM-BW-F | S | Own ½ | 4.77 | Bendix | Sag | S 54½ | Tryon | Al-Z | 17x6.00 |
| Packard Twin Six | Morse | — | — | *Long | O | 3 | SM | — | Own ½ | — | M | Own | S 60½ | Own | — | 19x7.00 |
| Packard Stan. 8 | Morse | N E | Dyn | Long | O | 4 | SM | M | Own ½ | 4.66 | M | Own | S 60½ | Own | Bijur | 6.50x19 |
| Packard De L. 8 | Morse | N E | Dyn | Long | O | 4 | SM | M | Own ½ | 4.66 | M | Own | S 60½ | Owr | Bijur | 7.00x19 |
| Packard Light 8 | Morse | N E | *Dyn | *Long | O | 3 | SM | M | Own ½ | 4.66 | M | Own | S 56 | Own | Alem | 17x6.50 |
| Peerless De L. Mas. | Morse | Aut-L | *Aut-L | Rock | WG | 3 | WG-F | S | Sal ½ | 4.45 | Bendix | Ross | S 60 | Rub B | Alem | 31x6.00 |
| Peerless Custom 8 | Morse | Aut-L | *Aut-L | Rock | WG | 3 | WG-F | S | Sal ½ | 4.80 | Bendix | Ross | S 60 | Rub B | Alem | 31x6.50 |
| Pierce-Arrow 54 | Chain | Del-R | *Del-R-S | Long | O | 3 | SM-F | S | Own ½ | 4.42 | Bendix | Ross | S 61 | Faf | Myers | 18x6.50 |
| Pierce-Arrow 52 | Chain | Del-R | *Del-R-S | Long | O | 3 | SM-F | S | Own ½ | 4.42 | Bendix | Ross | S 61 | Faf | Myers | 18x7.00 |
| Pierce-Arrow 53 | Chain | Del-R | *Del-R-S | Long | O | 3 | SM-F | S | Own ½ | 4.58 | Bendix | Ross | S 61 | Faf | Myers | 18x7.00 |
| Plymouth | Var | Del-R | Del-R | *Own | O | 3 | BW-F | O | Own ½ | 4.33 | H | War | S 53⅜ | — | Al-Z | 18x5.25 |
| Pontiac 6 | Chain | Del-R | Del-R | — | — | — | SM-BW-F | — | Own ½ | 4.55 | Bendix | Sag | S 54 | Inlox | — | 18x5.25 |
| Pontiac V-8 | Link | Del-R | Del-R | — | — | — | SM-BW-F | — | Own ½ | 4.22 | Bendix | Sag | S 54½ | — | — | 17x6.00 |
| Reo Fly. Cloud "S" | Chain | — | — | — | — | 3 | SM-F | — | Own ½ | 4.60 | H | Ross | S 55 | — | — | 17x5.50 |
| Reo Royale 8-35 | Morse | Del-R | Del-R | Long | O | 3 | SM | U | Own ½ | 4.07 | H | Ross | S 57½ | Own | Far | 6.50x18 |
| Reo Royale 8-31 | Morse | Del-R | Del-R | Long | O | 3 | SM | U | Own ½ | 4.07 | H | Ross | S 57½ | Own | Al-Z | 6.50x18 |
| Reo 8-21 | Link | Del-R | Del-R | Long | O | 3 | SM | U | Own ½ | 4.42 | H | Ross | S 55¾ | Tryon | Al-Z | 17x6.00 |
| Reo 6-21 | Morse | Del-R | Del-R | Long | O | 3 | SM | U | Own ½ | 4.07 | H | Ross | S 55¾ | Tryon | Al-Z | 17x6.00 |
| Reo Fly. Cloud 6-25 | Morse | Del-R | *Del-R | Long | O | 3 | SM | U | Own ½ | 4.42 | H | Ross | S 55¾ | Own | Al-Z | 17x6.50 |
| Reo 8-25 | Link | Del-R | *Del-R | Long | O | 3 | SM | U | Own ½ | 4.42 | H | Ross | S 55¾ | Own | Al-Z | 17x6.50 |
| Rockne 6-65 | Morse | Aut-L | *Aut-L-S | Borg | O | 3 | SM-BW-F | M | Spic ½ | 4.27 | Bendix | Ross | S 54 | Tryon | Al-Z | 18x5.25 |
| Rockne 6-75 | Chain | Aut-L | *Aut-L-S | Borg | O | 3 | SM-BW-F | M | Own ½ | 4.73 | Bendix | Ross | S 54 | Tryon | Al-Z | 18x5.50 |
| Studebaker 6-55 | Chain | Del-R | *Del-R-S | Long | O | 3 | SM-BW-F | S | Own ½ | 4.27 | Bendix | Ross | S 54 | Tryon | Alem | 18x5.50 |
| Studebaker Dict. 62 | Cel | Del-R | *Del-R-S | Long | O | 3 | SM-BW-F | S | Own ½ | 4.73 | Bendix | Ross | S 54 | Tryon | Alem | 18x5.50 |
| Studebaker Com. 71 | Cel | Del-R | *Del-R-S | Long | O | 3 | SM-BW-F | S | Own ½ | 4.73 | Bendix | Ross | S 56 | Faf | Alem | 18x6.00 |
| Studebaker Pres. 91 | Var-G | Del-R | *Del-R-S | Borg | O | 3 | SM-BW-F | S | Own ½ | 4.31 | Bendix | Ross | S 60 | Faf | Alem | 18x6.50 |
| Stutz LAA | Link | Del-R | Del-R | Borg | D | 4 | — | U | Sal ½ | 4.75 | H | Gem | S 60 | Own | Bijur | 19x6.00 |
| Stutz SV-16 | Link | Del-R | Del-R | Long | M | 3 | SM | M | Tim ½ | 4.75 | H | Gem | S 62¾ | Own | Bijur | 20x6.50 |
| Stutz DV-32 | Link | Del-R | Del-R | Long | M | 3 | SM | M | Tim ½ | 4.50 | H | Gem | S 62¼ | Own | Bijur | 20x7.00 |
| Willys-Ov'land 6-90 | Link | Aut-L | *Aut-L | — | O | 3 | SM-BW-F | S | Own ½ | 4.60 | Bendix | Own | S 51 | Tryon | Alem | 18x5.25 |
| Willys-Ov'land 8-88 | Link | Aut-L | *Aut-L | *Borg | O | 3 | SM-BW-F | S | Own ½ | 4.40 | Bendix | Ross | S 56 | Tryon | Alem | 18x5.50 |
| Willys-Kni. 66-D | Link | Aut-L | *Aut-L | — | O | 3 | SM-BW-F | S | Own ½ | 4.18 | Bendix | Gem | S 56 | Tryon | Alem | 17x6.00 |
| Willys-Knight 95 | Link | Aut-L | *Aut-L | — | O | 3 | SM-BW-F | S | Own ½ | 4.89 | Bendix | Gem | S 51 | Tryon | Alem | 18x5.50 |

### KEY TO ABBREVATIONS

**Weight**—‡Austin standard 2 passenger coupe. Stutz DV 145-inch wheel base weighs 5,352.

**Wheel Base**—*Over all length of chassis instead of wheel base, which manufacturers refuse to give.

**Engine Make**—Con. Continental; Lyc. Lycoming, Hall, De Vaux-Hall Motors Corp. *Air-cooled with spot temperature control. †Thermo syphon water circulation. ‡Floating power

**Thermostat**—Bish-Bab. Bishop & Babcock, Dole, Dole Valve Co., Chicago, Ill.; Ful, Fulton Co.; Har, Harrison; Pines, Pines Winterfront Var, various makes.

**Valve Arrangement**—L, L head; H, horizontal. O, overhead; K, sleeve valve; LV, V-type L head.

**Piston Material**—*Alum, aluminum with invar struts. Alum, aluminum alloy; CI, cast iron; S, St, semi-steel; Lo-Ex, Aluminum Corporation of America.

**Oil Purifier**—Wai, Wall; Han, Handy; AC, AC Spark Plug Company; Ste, Stewart-Warner; Ski, Skinner; Flo, Floato; Cuno, Cuno Engineering Corp; Pur, Purolator. *Using both Floato and Skinner. †Using AC with Floato attachment. **Using both AC and Purolator.

**Fuel Cleaner**—AC, AC Spark Plug Co.; Gas, Gascolator; Ste, Stewart-Warner; Til, Tillotson; V-S, Van Sicklen

**Carburetor**—Sch, Wheeler Schebler; Zen, Zenith; Mar, Marvel; Car, Carter; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; B&B, Borg & Beck.

**Air Cleaner**—AC, AC Spark Plug Company; AM, Air Maze; Un, United; Til, Tillotson

**Front End Drive**—Link, Link Belt; Tex, Texolite; Cel, Celeron; Diam, Diamond Chain; Morse, Morse Chain Company; Var, various makes of chains; Var-G various makes of gears.

**Ignition, Generator and Starter**—Aut-L, Auto-Lite; Del-R, Delco-Remy; Dyn, Owen-Dyneto Corp.; N E, North East *Nash.—Indicates twin ignition. *Bendic starter used. S—Startix equipped.

**Clutch**—Borg, Borg & Beck; Br-L, Brown-Lipe; Rock, Rockford Machine; Long Long Clutch Company; Rus, Russell Mfg. Co. *Bendix Clutch Control.

**Transmission Make**—D, Detroit Gear; WG, Warner Gear Company; M, Muncie Gear Company; O, Own; N, New Process Gear Corp.; W, Warner Corp. *Franklin Transcontinent models are equipped with both Warner and Detroit 3 or 4 speed gear sets, according to body type.

**Transmission Type**—DG, Detroit Gear & Machine Co.; LGS, The LGS Corp.; F, Free Wheeling; SM, Synchro Mesh; BW, Borg-Warner; NP—New Process Gear Corp.; WG, Warner Gear Co.

**Universals**—U, Detroit Universal Products; S, Spicer Mfg. Corp.; O, Own, M, Mechanics Universal Joint Company. *Cord using Detroit Universal Products and Mechanical Universal Joint Co.

**Rear Axle**—Col, Columbia; Sal, Salisbury; Spic, Spicer Mfg. Corp.; Tim, Timken; N.P., New Process Gear Corp.; ½, Semi-floating; &, ¾ floating; F, Full floating; ‡Adams used on custom models.

**Ratio**—*Dual ratio optional; Hudson 132-in wheel base models have rear axle ratio of 5.10.

**Brakes**—H, hydraulic; M, mechanical; Bendix, Bendix Brake Corp. *Equipped with Vacuum Booster.

**Steering Gear**—Gem, Gemmer; Ross, Ross Gear and Tool Company; Sag, Saginaw; Say-B Saylor-Beall Manufacturing Company; War, Warner; N.P., New Process Gear Corp. †Ross used on custom models

**Rear Springs**—S, semi-elliptic; El, full elliptic; Cant, semi-cantilever; S-Tr semi-transverse.

**Spring Shackles**—Tryon, Willys-Morrow Company; Rub B, Rubber Shock Insulator Company; Faf, Fafnir Bearing Company; ERS, Eaton Products, Inc.; Inlox—Inland Mfg. Co.; *Tryon, front, ERS, rear. *Own, front, ERS, rear.

**Chassis Lubricator**—Alem, Alemite; Al-Z, Alemite Zerk; Bijur, Bijur Lubricating Corp.; Far, Farval. Myers—Chassis Lubricating Co.

**Tires**—Auburn 12, custom models equipped with 17x6.50. *Hudson 122-in. wheel base models equipped with tires 17x6.50. Stutz 145-inch wheelbase models have 20x7.00 tires

## MERIT RATING SYSTEM INCREASED BY FIDELITY

**Newark, N. J.,** April 22.—The new Jersey Fidelity and Plate Glass Insurance Company of Newark has made an important announcement regarding its stand on the merit rating system, in part as follows:—

"This company did not discard the merit rating system on automobile pleasure vehicles as most other companies have done, but on the contrary, we are now extending, effective immediately on new and renewal business, the credit to 15 per cent. on qualified risks where heretofore 10 per cent. was the discount.

"In order to continue these reduced rates it is imperative that our underwriting practice be maintained on the highest standard with discriminating supervision. This new merit rating system becomes effective on and after April 1."

### HUDSON COUNTY GROUP HEAR ARTHUR PHILLIPS

**Union City, N. J.,** April 22.—The Hudson County Garage Owners and Gasoline Dealers' Association was the guest of the National Oil and Supply Company. There were several hundred members in attendance. Among the guests and speakers were Arthur Phillips, president of the host organization; William Ford, superintendent of the Quaker State Oil Company of Oil City, Pa.; R. E. Hare, lubricant specialist for the same organization; Frank Dale, sales manager, and Fred Berg, treasurer of the host company.

### TRICO PRODUCTS CORP.

**New York,** April 22.—Trico Products Corporation (motor car equipment) reports for quarter ended March 31, 1932, net profit of $356,459 after charges and taxes, equivalent to 95 cents a share on 374,991 no par shares of unrestricted stock. This compares with $514,262, or $1.37 a share, in first quarter of 1931.

**Notice**

Please see the fifth column to the left, giving steering gear information. Notice the outstanding Ross predominance. This preference for Ross exists not only in the passenger car field, but in the truck and bus field and other divisions of the automotive industry as well. Passenger car figures are:

**ROSS**
**28**
★
**FIRST Competitor**
**19**
★
**SECOND Competitor**
**13**
★
**THIRD Competitor**
**2**
★
**Build Their Own**
**10**

**ROSS**
**CAM AND LEVER STEERING**
**Roller Mounted**
★
**206**
**Engineering Staffs Prefer Ross**

# DOUBLED!

## REO'S DUAL FRANCHISE

## Now twice as valuable

★ ★ ★

### TWO PROFITS WITH ONE OVERHEAD

● Reo truck sales for the last nine consecutive months have exceeded every corresponding month of the previous year.

In a market of constant declines, Reo steadily advances!

No wonder 600 new dealers joined Reo. The volume possibilities for a truck line like Reo's are apparent to anyone who makes even a casual study of his market.

And now Reo doubles the value and appeal of its dual franchise by introducing a magnificent new air-streamed Flying Cloud at $995!

Two years ago the same type Flying Cloud sold for $1595. Yet this new car is finer, faster and infinitely more beautiful. Aerodynamic throughout, it is today's closest parallel to its elder sister, the distinguished and much-copied Reo-Royale.

For a steady, year-round money making opportunity, Reo never offered more—and for 27 years Reo dealers have been among the most consistent money makers in the business!

*Reo Trucks and Speedwagons range from 1½ ton to 4 tons. Prices $625 to $2800. The New 6-cylinder Speedwagon with the Gold Crown engine at $745. Chassis f. o. b. Lansing.*

*The New Tractor-Trailer unit—1½ ton to 4 ton Tractors with matched semi-trailers, gross capacity—16,000-35,000 lbs. $1575 and up. Chassis f. o. b. Lansing.*

*Reo Flying Cloud passenger car prices range from $995 to $1565. Reo-Royale passenger car prices range from $1785 and up. Standard models—f. o. b. Lansing.*

**REO MOTOR CAR COMPANY - LANSING - TORONTO**

REO MOTOR CAR CO., Lansing, Michigan.
Please send me at once—either by letter or through your representative—details of the Reo Dual Franchise.

Line (s) now handled_____

My Firm Name_____

Address_____ (City) _____ (State)

ADN 4-23 By_____